CITY OF FORT WORTH QUICK FACTS

- Fort Worth's goal is to beneficially land apply 100% of all Biosolids
- Biosolids facility is operated by Renda Environmental Inc., in a public/private partnership.
- The City of Fort Worth's biosolids program received EMS (Environmental Management System) certification through the National Biosolids Partnership on July 20, 2005; making it the first program in Texas to be awarded this certification.
- At typical biosolids application rates (7 dry tons/acre), each acre of land receives 120lbs of plant available nitrogen, 70lbs of plant available phosphorus, and 20lbs of plant available potassium.

FOR MORE INFORMATION

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SOURCES

1-Texas Administrative Code; Title 30 Part 1 Chapter 312 Subchapter B Rule §312.43

2-Jaynes, W.F., Zartman, R.E., Sosebee, R.E. and Wester, D.B., 2003. Biosolids Decomposition after Surface Applications in West Texas. Journal of Environmental Quality 32, 1773-1781.

3-Mata-González, R., Sosebee, R.E. and Wan, C., 2002. Physiological impacts of biosolids application in desert grasses. Environmental and Experimental Botany 48, 139-148.

4-National Research Council. 1996. Use of Reclaimed Water and Sludge in Food Crop Production. National Academy Press, Washington, D.C., pp. 176.

5-Shober, A.L., Stehouwer, R.C. and Macneal, K.E., 2003. On-Farm Assessment of Biosolids Effects on Soil and Crop Tissue Quality. Journal of Environmental Quality 32, 1873-1880.

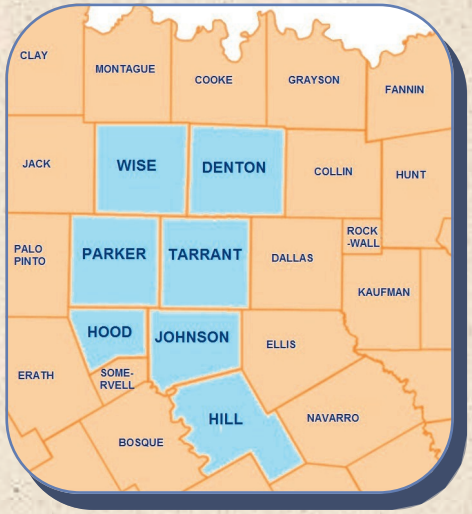
FORT WORTH®
WATER

Biosolids
Technical information

Biosolids Program

BENEFICIAL REUSE BY LAND APPLICATION

Biosolids produced at the Village Creek Water Reclamation Facility are processed, monitored, and agronomically land applied to thousands of acres of farmland and pastureland in Tarrant and six surrounding counties in the North Texas area.



Since 1991, the City of Fort Worth has produced Class "A" Exceptional Quality biosolids.

This is the highest quality recognized by The Environmental Protection Agency

MONITORING & MEASUREMENT

- By City contract, the Contractor uses an independent certified laboratory to analyze the biosolids produced at Village Creek Water Reclamation Facility.
- Samples of biosolids are taken from the process areas and analyzed for fecal coliform, pathogens, metals, PCBs, pH , and percent solids.

Class "A" Biosolids Monitoring-Fort Worth Biosolids Program	
Pathogen Reduction	30 TAC 312.82 (a) Alternative 4 Fecal Coliform Density <1000 MPN* (*Most Probably Number) Enteric Virus Density <1 Plaque-forming unit per 4 gram total solids** Viable Helminth Ova Density <1 per 4 grams total solids** (**Dry weight basis)
Vector Attraction Reduction	30 TAC 312.83 (b) (1-8) Alternative 6 pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two hours and then remain at a pH of 11.5 or higher for an additional 22 hours
Monitored Item	**Frequency**
Fecal Coliform	Two (2) times per month
Pathogens	Two (2) times per month
Metals	Monthly
PCBs	Monthly
TCLP	Annually
pH (Vector Attraction Reduction)	Operation Process-Daily; Regulatory Compliance-Weekly
% Solids	Daily

Safety: What makes biosolids great for land application?

- It has been estimated that biosolids within 95% of the ceiling limits (EPA requirement) would need to be applied to an area for 75 years before the soil concentration of those elements increased to a level of concern[4].
- In one study, cattle were fed a diet consisting of 12 percent biosolids material for 94 days and showed no adverse effects. Another study fed cattle a diet of 6 percent biosolids material for 141 days and again no adverse effects were observed[4].
- A multi-year study of people living near biosolids application sites was conducted. This study showed no significant differences in the health of the people near biosolids application versus people not near biosolids application. The same held true for their domestic animals[4].
- In biosolids amended fields the concentration of trace elements in crops does not increase[5].

The City of Fort Worth produces biosolids below the regulatory limits for metal concentrations.

The data below is from sampling activities conducted between September 2012 to July 2013.

Sept. 2012-July 2013	Average Monthly Concentration (mg/kg)	Monthly Concentration Permit Limits[1] (mg/kg)	Percent of Monthly Concentration Limits (%)
Arsenic	9.61	41	23.44
Cadmium	1.15	39	2.95
Chromium	40.24	1200	3.35
Copper	458.45	1500	30.56
Lead	26.89	300	8.96
Mercury	0.46	17	2.71
Molybdenum	14.19	N/A	N/A
Nickel	31.65	420	7.54
Selenium	4.13	36	11.47
Zinc	616	2800	22.00

WATER CONSERVATION

- Our product contains approximately 20% solid material which means the other 80% is water. This acts to reduce the irrigation needs in the hot Texas summer months.
- When properly applied, biosolids pose almost no risk to groundwater or surface water[4].

SOIL STABILITY

- Biosolids add organic material to the soil, which help bind soil particles into aggregates which in turn increase the pore space of the soil. One study observed an increase of aggregates of almost one-third[4].
- The increase in aggregate formation acts to reduce the erosion potential of the soil[2].
- Aggregate stability also increases with the addition of biosolids. Another study showed this increase to be approximately 24 percent[4].

CROP PRODCUTION

- Biosolids contain inorganic forms of nitrogen which are immediately available to crops. The organic component must undergo mineralization to become available[4].
- Crops in fields supplemented with biosolids tend to have an increased leaf biomass[3].
- Biosolids contain many trace elements, essential for plant growth[4].
- Due to the slow release component of biosolids, beneficial effects are seen up to three years after application.